Practice Test 1 Math 15 Spring 2019 Jones Name________________________________

Determine whether the given value is a statistic or a parameter.

1) After inspecting all of 55,000 kg of meat stored at the Wurst Sausage Company, it was found that 45,000 kg of the meat was spoiled. What proportion of the meat spoiled? Is this proportion a statistic or a parameter?

Identify the number as either continuous or discrete.

2) The number of stories in a Manhattan building is 22.

3) A researcher wants to obtain a sample of 100 school teachers from the 800 school teachers in a school district. On another sheet, describe procedures for obtaining a sample of each type: random, systematic, convenience, stratified, cluster.

Determine which score corresponds to the higher relative position.

4) Draw two Normal curves one for each tests showing a z-axis and an x-axis. Lable the mean, test scores and calculated z-score. Which score has a better relative position, a score of 44 on a test for which $\overline{x} = 40$ and $s = 4$, or a score of 283.4 on a test for which $\overline{x} = 260$ and $s = 26$? Draw a Normal distribution for both tests. Label x and z axes with the test score and it's z-score.

Solve the problem.

5) The ages of the members of a gym have a mean of 40 years and a standard deviation of 14. Use the range rule of thumb to estimate the minimum and maximum "usual" ages. Is 72 an unusual age for a gym member?

Compare the two sets of results.

6) When investigating resting pulse rates of men and womenthe following results were obtained.

Men	120	77	89	97	124	68	72	96
Women	115	86	49	56	78	76	78	95

a) Find the Mean , Standard Deviation, Variation , Q1, Minimum, Median, Q3, Maximum, Mode, Range, and Midrange.

b) Construct a side by side box plot and for these two data sets.

c) Compare the centers of these two sets.
d) Compare the spread of these two sets.

7) Explain how two data sets could have equal means and modes but still differ greatly. Give an example with two data sets to illustrate.

8) The textbook defines **unusual** values as those data points with z scores less than $z = -2.00$ or z scores greater than $z = 2.00$. Comment on this definition with respect to "the Empirical Rule"; refer specifically to the percent of scores which would be defined as **unusual** according to "the Empirical Rule".

9) Sometimes probabilities derived by the relative frequency method differ from the probabilities expected from classical probability methods. How does the law of large numbers apply in this situation? Look up in book.

Find the indicated probability.

10) A class consists of 69 women and 68 men. If a student is randomly selected, what is the probability that the student is a woman?

11) If you pick a card at random from a well shuffled deck, what is the probability that you get a face card or a spade?

12) A sample of 100 wood and 100 graphite tennis rackets are taken from the warehouse. If 5 wood and 10 graphite are defective and one racket is randomly selected from the sample, find the probability that the racket is wood or defective.

13) A bag contains 7 red marbles, 4 blue marbles, and 1 green marble. Find P(not blue).

Find the indicated probability.

14) A restaurant offers 9 entrees and 11 desserts. In how many ways can a person order a two–course meal?

Find the indicated probability.

15) Describe an event whose probability of occurring is 1 and explain what that probability means. Describe an event whose probability of occurring is 0 and explain what that probability means.

16) Consider the frequency table below which has single values as classes:

12 classes

Value	Frequency
10	1
11	3
12	7
13	18
14	10
15	4
16	2
17	7
18	16
19	10
20	6
21	2

4 classes

Value	Frequency

6 classes

Value	Frequency

Construct a new frequency table for this data with 4 classes.
Now construct a another frequency table for this data with 6 classes.

Suppose that you construct a histogram corresponding to the original data and histograms corresponding to eacl new frequency tables. Describe the shapes of the three histograms. Does the histogram with six classes capture tl distribution of the data? Does the histogram with four classes capture the distribution of the data?

Provide an appropriate response.

17) A computer company employs 100 software engineers and 100 hardware engineers. The personnel manager randomly selects 20 of the software engineers and 20 of the hardware engineers and questions them about career opportunities within the company. a) What sampling technique is being used? b) Does this sampling plan result in a random sample? c) Simple random sample? d) Explain.

Find the indicated probability.

18) Among the contestants in a competition are 42 women and 28 men. If 5 winners are randomly selected, what is the probability that they are all men? a) In how many ways can 5 people be selected from this group of 70? b) In how many ways can 5 men be selected from the 28 men? c) Find the probability that the selected group that will consist of all men.

19) A batch consists of 12 defective coils and 88 good ones.

a) Find the probability of getting three defective coils when three coils are randomly selected if each selection is replaced before the next is made. Show method used to get answer.

b) If X=the number of defective coils when 3 are selected. Make a probability distribution for the number of defective coils out of 3 when the selections are done with replacement.

x	P(x)

c) Find the probability of getting at least one defective coil. You get extra credit if you can find both methods for solving this problem.

Solve the problem.

20) 8 basketball players are to be selected to play in a special game. The players will be selected from a list of 27 players. If the players are selected randomly, what is the probability that the 8 tallest players will be selected?

21) There are 9 members on a board of directors. If they must elect a chairperson, a secretary, and a treasurer, how many different slates of candidates are possible?

Solve the problem involving probabilities with independent events.

22) A single die is rolled twice. Find the probability of getting a 2 the first time and a 2 the second time.

Find the indicated probability.

23) The following table contains data from a study of two airlines which fly to Small Town, USA.

	Number of flights which were on time	Number of flights which were late
Podunk Airlines	33	6
Upstate Airlines	43	5

a) If one of the flights is randomly selected, find the probability that the flight selected arrived on time given that it was an Upstate Airlines flight.

b) If one of the flights is randomly selected, find the probability that the flight selected arrived on time and was an Upstate Airlines flight.

c) If one of the flights is randomly selected, find the probability that the flight selected arrived on time or was an Upstate Airlines flight.

d) If one flight is randomly selected find the probability that it is on time.

e) If two flights were randomly selected find the probability that both flights were on time. Calculate this probability with and without replacement.

f) Is the probability of being on time independent of the airline chosen? Explain.

Then use the Binomial Theorem to find the probability exactly.

24) An engineer thinks that she had improved the quality of the circuit boards that she is designing. The defect rate has been 14%. But in the last sample of 50 parts she found that only 4 were defective. Is this conclusive proof that she improved her design or is this sample usual to see when the defect rate is 14% and more data needed to be sure that the defect rate really has decreased. Assume that many thousands of parts are being produced.

a) What is the mean and standard deviation of the binomial distribution used for this problem.

b) How many do we expect to be defective?

c) What is the proability that we see a sample with at most 4 when the defect rate is 14%?
Use the binomial Distribution.

d) Does this sample verify her claim that the defect rate has been lowered?

Answer the question.

25) Suppose that computer literacy among people ages 40 and older is being studied and that the accompanying tables describes the probability distribution for four randomly selected people, where x is the number that are computer literate.

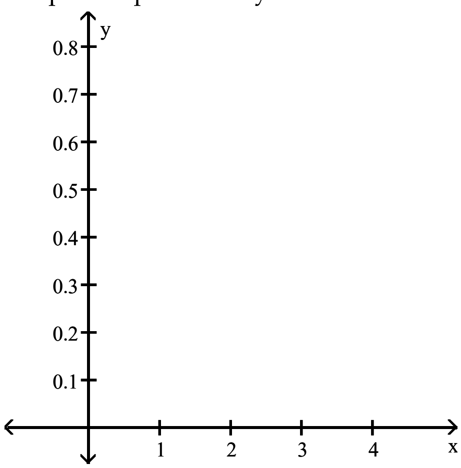
a) is this a probability distribution________

x	P(x)
0	0.16
1	0.25
2	0.36
3	0.15
4	0.08

Is it unusual to find four computer literates among four randomly selected people? (WHY?)

What is the probability of getting 2 or fewer people out of the 4 who are computer literate?__________

Graph this probabillity distribution.



Find the mean of this probability distribution.

Find the Standard deviation of this distribution.

26) Suppose you buy 1 ticket for $1 out of a lottery of 1,000 tickets where the prize for the one winning ticket is to be $500. What is your expected value?